REMARKS

Claims 1-20 are cancelled.

Claims 21-40 are pending.

Claims 21-40 are rejected.

The independent claims are 21, 29, 38.

2. Claims 21-25, 28-34, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gummiwerke (GB 867,103) in view of Mechanics of Pneumatic Tires (Page 373).

As best depicted in Figure 1, Gummiwerke discloses a pneumatic tire construction designed to operate more efficiently during an underinflated or runflat condition, wherein said tire includes a wedge insert or stiffener 3 disposed on an inner surface of each sidewall portion. The stiffener of Gummiwerke includes a plurality of intervening circumferential grooves or cuts 9 that separate said stiffener into distinct segments (reference characters 4-8), wherein the outer surface of a segment and the inner surface of an adjacent segment intersect at a point (segments have the capability of pivoting in an analogous manner to the claimed invention). Gummiwerke, however, is completely silent to the additional features of the tire, particularly the makeup of the carcass. While not expressly depicted by Gummiwerke, the carcass represents a fundamental tire component formed of the primary structural reinforcing elements and one of ordinary skill in the art at the time of the invention would have readily appreciated and expected the tire of Gummiwerke to include a carcass structure. Furthermore, the specific selection of a radial carcass construction would have been obvious to one of ordinary skill in the art at the time of the invention since it represents the most common and well known carcass arrangement used in the manufacture of modern day tires, as shown for example by Mechanics (Page 373).

As to claims 22, 23, 28, and 37, Figure 1 of Gummiwerke clearly depicts a saw tooth construction in which the respective surfaces (inner and outer surfaces of the segments) are flat. In this instance, the cuts are not entirely through the thickness of the rubber wedge insert or stiffener.

With respect to claims 24 and 34, the cuts or grooves 9 close during an underinflated or runflat condition (Page 2, Lines 65-70).

Regarding claims 25 and 29-32, while the figures of Gummiwerke appear to depict the segments as being formed of flat surfaces, one of ordinary skill in the art at the time of the invention would have readily appreciated additionally configurations, such as non flat surfaces, for the segments. In particular, the critical feature of Gummiwerke is that the respective surfaces of adjacent segments have the ability to contact each other during an underinflated or runflat condition. This requires the respective surfaces to have shapes that are compatible such that an interlocking relationship is established. One of ordinary skill in the art at the time of the invention would have found it obvious to form any of the segments with convex or concave surfaces as long as the adjacent surface is formed with a complimentary configuration.

3. Claims 26, 27, 35, 36, and 38-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gummiwerke as applied in claims 21 and 29 above and further in view of Kawabata (JP 3-104710).

As noted in the previous paragraph, Gummiwerke is directed to a runflat tire construction having a rubber member or stiffener, wherein said stiffener contains a plurality of cuts or grooves that define segments. In describing the tire, Gummiwerke suggests a tubeless tire construction, which is recognized as referring to a tire without an inner tube (Page 2, Lines 9-19). Although Gummiwerke fails to expressly describe an innerliner, it is extremely well known that an innerliner is a fundamental component of tubeless tires and is extensively provided in order to reduce the amount of air in the tire structure (promotes air impermeability). In essence, a tubeless tire contains an innerliner in place of an inner tube to provide the function of limiting the amount of air in the tire structure. One of ordinary skill in the art at the time of the invention would have expected the "tubeless tire" of Gummiwerke to include an innerliner in view of the description as such. The Office Action only cited JP4-334603 to Kamegawa. Therefore, the undersigned assumes that this is he reference referred to. Kamegawa provides one example of a similar runflat tire construction in which a well-known innerliner is provided. It is noted that the runflat member of Kamegawa similarly has grooves or indentations at its axially inner surface- in this

instance, the innerliner conforms to the geometry of the runflat member and is existent over the inner and outer surfaces that surround a given indentation. Additionally, one of ordinary skill in the art at the time of the invention would have found it obvious to position the innerliner outward of the runflat member as it is well known in the tire industry to place reinforcing members within the tire cavity. It is emphasized that Gummiwerke only requires that the rubber stiffener is attached to the inside of the sidewalls of a tubeless tire- the rubber stiffeners would provide the same reinforcing capabilities if they were attached to the innerliner or if they were attached to the carcass structure. Absent any conclusive showing of unexpected results, one of ordinary skill in the art at the time of the invention would have found it obvious to include an innerliner in the tubeless tire of Gummiwerke and furthermore, would have found it obvious to position the innerliner inwards or outwards of the rubber stiffener as each construction defines well known arrangement in the tire industry.

The Present Invention

The invention is generally directed to an innovative saw-tooth wedge insert design that gives stiffness and rigid reinforcement to the sidewalls during runflat operation while maintaining good flexibility during normal-inflated operation. Furthermore, the "saw-tooth" design of the wedge inserts of the present invention provide to the tire designer a means by which to "tune" various runflat tire designs according to the intended final use of the tire. In other words, the number of grooves, and their shapes and volumes between the "tooth" segments of the wedge insert present a design variable that, in combination with the chosen properties of the material from which the wedge insert is made, afford the tire designer a wide latitude within which to design runflat tires having nearly any desired balance between inflated and runflat performance. (page 14, lines 10-25)

Figure 4 shows an embodiment wherein a sawtooth wedge insert 50 comprises a plurality of segments 52a,52b,52c,52d,52e (52a-52e). Each segment 52a-52e is separated, during normal-inflated operation, from the adjacent segments 52a-52e by intervening circumferential grooves 54a,54b,54c,54d (54a-54d). Each circumferential groove 54a-54d is bounded by a radially outermost flat surface 56 of the radially outermost segment and by a radially innermost flat surface 58 of the radially innermost segment of the adjacent segments on either side of the groove. The point P, which

is the point of intersection of surfaces 56 and 58, can have different configurations to reduce stress concentration and/or enhance the pivoting of the two surfaces with respect to each other. (page 15, line 23 though page 16, line 11)

Figure 4A illustrates an alternative embodiment of the wedge insert 150a. In this embodiment, each intervening groove 154a,154b,154c,154d (154a-154d) is bounded by convex surfaces 156,158 which are respectively shaped such that each radially outermost non-flat surface 156 can, during the most extreme deflection of the wedge insert 150a, engage the corresponding non-flat surface 158 that defines the radially inwardmost surface of each intervening groove 154a-154d between the respectively adjacent segments 152a-152e. This interaction, i.e. between the concave and adjacent convex surfaces, prevents axial deflection in addition to radial deflection of the sidewalls. Besides being in a reversed order, i.e. the concave surface being the radially outermost surface, other non-flat surfaces can be employed. (page 16, line 31 through page 17, line 22)

Figure 4B shows that the innerliner 57 can be on the inner surface of the insert 50, and **Figure 4C** shows that the innerliner can be between the insert 50 and the inner ply 30.

Arguments Traversing the teachings of the Cited Documents(s)

GB 867,103 (Gummiwerke) discloses a tire 1 having a stiffener 3 made of rubber and attached to the inside of each sidewall 2. The stiffener extends circumferentially, continuously all the way round the sidewall of the tire, and extends radially from a point near the radially inner extremity of the tire to a point near the center of the tread. The stiffener 3 is divided into individual circumferential ribs 4-8, separated from each other by wedge-shaped gaps 9. The "ribs" of Gummiwerke are generally comparable to the saw-tooth shaped segments of the present invention.

There are three main differences between the present invention and the prior art represented in the Gummiwerke document, as follows:

1. Individual ribs, versus segments pivotally attached to one another

The Gummiwerke stiffener comprises ***"individual" ribs***. See page 2, lines 43-44 ("The stiffener is

divided into individual circumferential ribs ... separated from one another by wedge-shaped gaps.") and lines 55-56 ("the stiffener is divided into single ribs").

This refutes what the Examiner said above, "As to claims 22, 23, 28, and 37, Figure 1 of Gummiwerke clearly depicts a saw tooth construction in which the respective surfaces (inner and outer surfaces of the segments) are flat. In this instance, the cuts are not entirely through the thickness of the rubber wedge insert or stiffener."

In contrast to Gummiwerke, the wedge insert of the present invention can be one piece, having a plurality of segments, which are pivotally attached to one another (at the hinge point "P"). This feature is set forth in **independent claim 21,** which reads as follows: "the outer surface of a given segment and the inner surface of an adjacent segment intersect at a hinge point P, and the segments can therefore pivot with respect to each other." Support for this feature can be found in the description at page 16, lines 7-11, 26. See also **claim 33.**

The possibility of all the segments being connected with one another is clear from the statement "The length of the surfaces 56, 58 extend the thickness of the insert ***or less*** as desired." (page 16, lines 6-7; emphasis supplied) See **claims 28, 37** ("the length of the inner and outer surfaces of the segments extend less than the thickness of the insert")

See also page 19, lines 25-27. With reference to Figure 7, "The sidewalls **80,82** each contain a single circumferentially disposed wedge insert **50a,50b** according to the saw-tooth shape of the present invention." See **claim 21** as amended herewith.

The saw-tooth shape limitation of **claim 23,** now canceled, is incorporated in to **claim 21.** The convex/concave limitations of **claim 31** are now incorporated into amended **claim 23.**

2. Ribs with flat surfaces, versus segments with non-flat surfaces.

The ribs of the Gummiwerke stiffener have ***flat surfaces.*** The present invention discusses a limitation (problem) with flat surfaces, and discloses non-flat, convex and concave surfaces.

A benefit is noted that the interaction between the non-flat surfaces "prevents axial deflection in addition to radial deflection of the sidewalls". This feature is set forth in **independent claim 29**, which finds support in the specification at page 16, line 31 through page 17, line 22.

The Examiner has stated " Regarding claims 25 and 29-32, while the figures of Gummiwerke appear to depict the segments as being formed of flat surfaces, one of ordinary skill in the art at the time of the invention would have readily appreciated additionally configurations, such as non flat surfaces, for the segments. In particular, the critical feature of Gummiwerke is that the respective surfaces of adjacent segments have the ability to contact each other during an underinflated or runflat condition. This requires the respective surfaces to have shapes that are compatible such that an interlocking relationship is established. One of ordinary skill in the art at the time of the invention would have found it obvious to form any of the segments with convex or concave surfaces as long as the adjacent surface is formed with a complimentary configuration."

Although it may be obvious to form the respective surfaces of adjacent segments so that they have the ability to contact each other during an underinflated or runflat condition, Applicant disputes the allegation that it is obvious to form any of the segments with convex or concave surfaces. The convex/concave mating arrangement is non-obvious. More specifically, having concave/convex surfaces accomplishes two things that are not present with flat surfaces. There is more surface area for contact between adjacent segments (all other things being equal). And, the convex/concave surfaces "interlock", thereby limiting (substantially preventing) radial forces being translated into axial forces, as would be the case with mating flat surfaces. See **claim 29** and claims depending therefrom. See also **claim 25**.

3. Inner Liner

The present invention discloses two possibilities for the ***location of the inner liner*** - either inside the insert, or between the insert and the sidewall. Gummiwerke is apparently silent on this point. This feature is set forth in **independent claim 38** which find support in the specification at Figures 4B, 4C, and at page 17, lines 23-31.

Independent **Claim 38** is rejected over Gummiwerke and Kawabata (JP 3-104710). Again, Applicant assumes that the Examiner meant Kamegawa since this was the only reference cited. Claims 38-40 deal with the innerliner, and where it is disposed. See, e.g., application Figures 4B and 4C, as discussed above.

The Examiner states "Absent any conclusive showing of unexpected results, one of ordinary skill in the art at the time of the invention would have found it obvious to include an innerliner in the tubeless tire of Gummiwerke and furthermore, would have found it obvious to position the innerliner inwards or outwards of the rubber stiffener as each construction defines well known arrangement in the tire industry."

Applicant diagrees. Gummiwerke does not show an innerliner. Applicant cannot ascertain where the innerlinere is (if at all) in the Japanese reference. It is not obvious to dispose the innerliner on the axially inner surfaces of the wedges. See **claim 39**.

Conclusion

Favorable examination and consideration are respectfully requested.

Respectfully submitted,

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